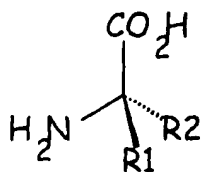
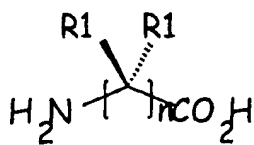


**CLAIMS:**

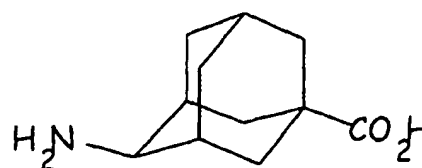
1. An oligomer or polymer selected from the group comprising:
  - (a) an oligomer or polymer comprising at least two  $\pi$ -conjugated amino acid subunits; and
  - 5 (b) an oligomer or polymer containing one or more  $\pi$ -conjugated amino acid subunits that are optically, electrically or electronically active.
2. The oligomer or polymer according to Claim 1, wherein the oligomer or polymer or oligomer is straight.
- 10 3. The oligomer or polymer according to Claim 1 wherein the oligomer or polymer is branched.
4. The oligomer or polymer according to any one of Claims 1 to 3 comprising one or more non-conjugated segments.
5. The oligomer or polymer according to Claim 4 comprising one or more  
 15 non-conjugated segments selected from the group comprising molecular structures 12, 13, or 14:



(12)



(13)



(14)

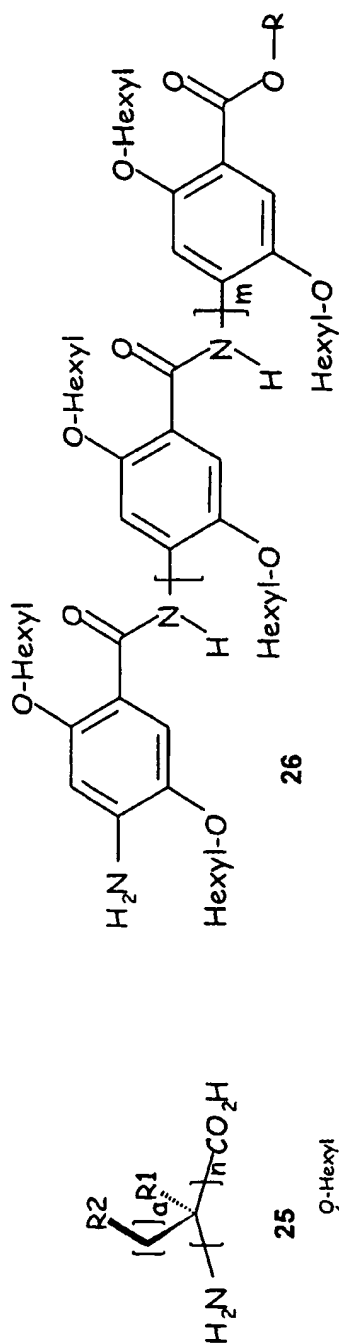
6. The oligomer or polymer according to any one of Claims 1 to 5 further comprising one or more dopeable segments.
- 20 7. The oligomer or polymer according to Claim 6 wherein the oligomer or polymer is the molecular structure of Fig. 12a.
8. The oligomer or polymer according to any one of Claims 1 to 7 comprising one or more photoreactive light absorbing subunits.

– 16 –

9. The oligomer or polymer according to any one of the Claims 1 to 8 comprising one or more light emitting molecules.

10. The oligomer or polymer according to Claim 9 selected from the group comprising molecular structures **25, 26, 27, and 28**:

- 17 -



- 18 -

11. The oligomer or polymer according to any one of the previous claims further comprising a recognition moiety.

12. The oligomer or polymer according to any one of the previous claims comprising one or more  $\pi$ -conjugated amino acid subunits that are optically,  
5 electrically or electronically active wherein the active subunits are embedded in the skeleton or backbone of the molecule.

13. The oligomer or polymer according to any one of the previous claims comprising one or more  $\pi$ -conjugated amino acid subunits that are optically,  
electrically or electronically active wherein the active subunits are attached as  
10 subunits to the skeleton or backbone of the molecule.

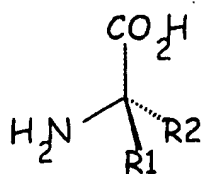
14. An optical, electronic or electric device comprising oligomers and/or polymers having one or more  $\pi$ -conjugated amino acids that are optically, electrically, or electronically active.

15. The device according to Claim 14, wherein the oligomer or polymer or oligomer is straight.

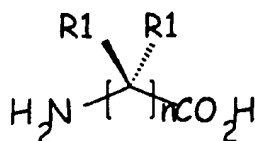
16. The device according to Claim 14 wherein the oligomer or polymer is branched.

17. The device according to any one of Claims 14 to 16 wherein the oligomers or polymers comprise one or more non-conjugated segments.

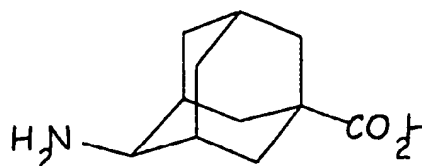
20 18. The device according to Claim 17 wherein the oligomers or polymers comprise one or more non-conjugated segments selected from the group comprising molecular structures 12, 13, or 14:



(12)



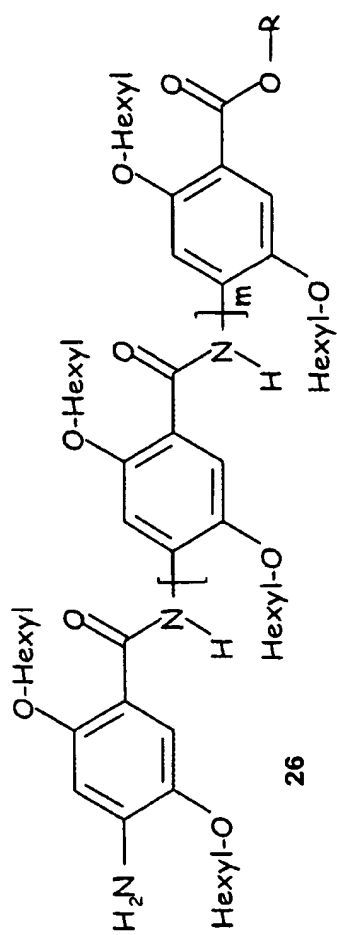
(13)



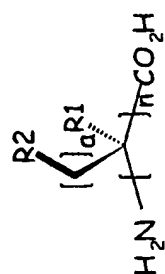
(14)

19. The device according to any one of Claims 13 to 18 further wherein the  
5 oligomers or polymers comprise one or more dopeable segments.
20. The device according to Claim 19 wherein the oligomer or polymer is  
the molecular structure of Fig. 12a.
21. The device according to any one of Claims 13 to 20 wherein the  
oligomers or polymers comprise one or more photoreactive light absorbing  
10 subunits.
22. The device according to any one of the Claims 13 to 21 wherein the  
oligomers or polymers comprise one or more light emitting molecules.
23. The device according to Claim 22 selected from the group wherein the  
oligomers or polymers comprise molecular structures 25, 26, 27, and 28.

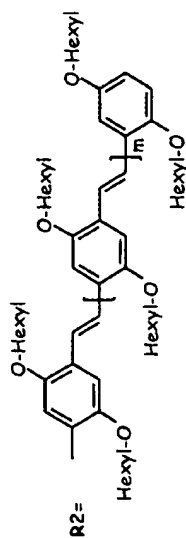
- 20 -



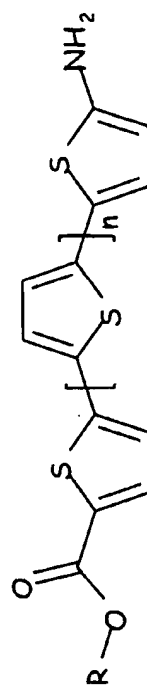
26



25



27



28

24. The device according to any one of the previous claims further wherein the oligomers or polymers comprise a recognition moiety.

25. The device according to any one of Claims 13 to 24 wherein the  
5 oligomers or polymers comprise one or more  $\pi$ -conjugated amino acid subunits that are optically, electrically or electronically active wherein the active subunits are embedded in the skeleton or backbone of the molecule.

26. The device according to any one of Claims 13 to 24 wherein the  
oligomers or polymers comprise one or more  $\pi$ -conjugated amino acid subunits that  
10 are optically, electrically or electronically active wherein the active subunits are attached as subunits to the skeleton or backbone of the molecule.

27. The electronic device according to any one of Claims 13 to 26 wherein the device is selected from the group comprising:

- (a) a wire;
- 15 (b) a resistor;
- (c) a diode;
- (d) a pn junction;
- (e) a transistor;
- (f) a field effect transistor;
- 20 (g) a photovoltaic cell;
- (h) a photosensor;
- (i) a light emitting diode;
- (j) a DNA chip; and
- (k) a sensory chip.